

**Hormone Options:**  
*Estrogen Therapy*

17β-estradiol, more commonly known as estradiol, is the bioidentical formulation of estrogen and the most effective form with the lowest risk profile when used for gender affirming therapy. There are several options for administration, and the choice is typically based on patient preference, accessibility, effectiveness, cost, and individual safety considerations.

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**Oral Estrogen Formulations**

Oral estradiol is dosed daily and therefore provides steady levels of estrogen in the body. This formulation is relatively cheap, accessible, and easy to administer.

Oral	
<b>Medication names</b>	Estradiol tablets
<b>Frequency</b>	By mouth daily
<b>Additional comments</b>	Some dissolve these tablets under the tongue, called sublingual (SL) dosing. The theory is that SL dosing may decrease the potential for estradiol affecting the liver (and the liver affecting the medication). However, this is not evidence-based and there is no data to support that SL dosing is any safer or more beneficial than swallowing the tablets. The amount absorbed under the tongue is likely to be variable and unpredictable. The benefits versus risks of this dosing method are largely unknown.

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**Topical Estrogen Formulations**

Topical estradiol appears to be the safest formulation from a cardiovascular standpoint, showing little impact on lipids (cholesterol) and decreased risk of thromboembolic events (blood clots, strokes) when compared to other formulations. This makes topical formulations ideal for those with higher than average cardiovascular risk, such as patients who are hypertensive, diabetic, or smokers. Topical formulations are also dosed daily, thereby providing the benefit of steady levels, as well as ease of use.

Patches	
<b>Medication names</b>	multiple brands available (Climara, Vivelle-dot)
<b>Frequency</b>	Patch(es) applied once or twice a week, depending on the brand.
<b>Additional comments</b>	Patches formulated for twice weekly use (change every 3-4 days) may be preferable for patients for whom adhesiveness is an issue.
Gels	
<b>Medication names</b>	Divigel packets, EstroGel actuated pump
<b>Frequency</b>	Applied daily
<b>Additional comments</b>	May be more expensive than other formulations. Less likely to cause a skin reaction (no adhesive as with the patch).

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**Injectable Estrogen Formulations**

Injectable estradiol is typically dosed intramuscularly (IM) every 2 weeks, though dosing weekly with smaller amounts is possible, with the benefit of decreasing the fluctuations between doses. The peak levels that occur just after dosing can feel affirming for some, and others have felt these may also produce changes more rapidly. However, there is no evidence to suggest that higher levels produce better or quicker results. Some avoid injectable formulations due to needlephobia, the inconvenience and time of injections (whether self-injecting or by a medical professional), and the wider fluctuations in hormone levels from dose to dose.

Injectables	
<b>Medication name</b>	Delestrogen (estradiol valerate)
<b>Frequency</b>	Injected every week or every 2 weeks IM.
<b>Additional comments</b>	Injectable estrogens have few applications outside of their use in gender affirmation, resulting in periodic shortages from the manufacturer and/or difficulty obtaining injectable estradiol. These shortages are likely to continue, and those with concerns about this may consider topical or oral formulations instead.
<b>Medication name</b>	Depo-estradiol (estradiol cypionate)
<b>Frequency</b>	Injected every 2 weeks IM.
<b>Additional comments</b>	<p>If switching from the valerate to the cypionate formulation, there is a dose adjustment needed. The dosing of estradiol cypionate is lower.</p> <p>Estradiol cypionate tends to produce a lower, later, and longer peak level when compared to estradiol valerate, but the average levels in the blood, and effects on the body, should be the same.</p>